

TRANSLATION OF AMENDMENT UNDER ARTICLE 19 OF THE TREATY

WHAT IS CLAIMED IS:

- 5 1. A high-frequency switch circuit common to high-frequency signals of a plurality of frequency bands comprising:
- a first high-frequency switch connected to a first terminal for inputting and outputting high-frequency signals for passing a transmitting signal of a first frequency band or a transmitting signal of a second
- 10 frequency band while blocking a received signal of said first frequency band and a received signal of said second frequency band; and
- a branching circuit comprising a first high-frequency circuit comprising a first phase shifter connected to said first terminal and a first bandpass filter disposed downstream thereof, and a second high-frequency
- 15 circuit comprising a second phase shifter connected to said first terminal and a second bandpass filter disposed downstream thereof,
- a transmission line for constituting said first phase shifter having such a line length that the impedance of said first high-frequency circuit viewed from the input side is substantially open at a passband frequency of said
- 20 second bandpass filter, a transmission line for constituting said second phase shifter having such a line length that the impedance of said second high-frequency circuit viewed from the input side is substantially open at a passband frequency of said first bandpass filter, whereby one received
- signal in said first and second frequency bands is permitted to pass while
- 25 the other received signal is shut off.
2. The high-frequency switch circuit according to claim 1, wherein said second high-frequency switch for passing a received signal of said first frequency band or a received signal of said second frequency band but

blocking a transmitting signal of said first frequency band and a transmitting signal of said second frequency band is disposed between said first terminal and said branching circuit.

3. (Amended) A high-frequency switch circuit common to

5 high-frequency signals of a plurality of frequency bands comprising:

first and second filter circuits connected to an antenna terminal and having different passbands from each other;

a first high-frequency switch connected to said second filter circuit for passing a transmitting signal of a first frequency band or a transmitting
10 signal of a second frequency band but blocking a received signal of said first frequency band and a received signal of said second frequency band;

a second high-frequency switch connected to said second filter circuit for passing a received signal of said first frequency band or a received signal of said second frequency band but blocking a transmitting
15 signal of said first frequency band and a transmitting signal of said second frequency band;

a branching circuit connected to said second high-frequency switch for passing one received signal in said first and second frequency bands but blocking the other received signal, comprising a first high-frequency
20 circuit comprising a first phase shifter connected to a terminal on the side of said second high-frequency switch and a first bandpass filter disposed downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said terminal and a second bandpass filter disposed downstream thereof; and

25 a high-frequency switch circuit connected to said first filter circuit for switching a transmitting signal path and a received signal path of a third transmitting/receiving system.

4. (Amended) A high-frequency switch circuit common to

high-frequency signals of a plurality of frequency bands comprising:

first and second filter circuits connected to an antenna terminal and having different passbands from each other;

5 a first high-frequency switch connected to said second filter circuit for switching a signal path for passing a transmitting signal of a first frequency band and a transmitting signal of a second frequency band, a signal path for passing a received signal of said first frequency band and a received signal of said second frequency band;

10 a branching circuit connected to said first high-frequency switch for passing one received signal of said first or second frequency band but blocking the other received signal, comprising a first high-frequency circuit comprising a first phase shifter connected to a terminal on the side of said first high-frequency switch and a first bandpass filter disposed downstream thereof, and a second high-frequency circuit comprising a
15 second phase shifter connected to said terminal and a second bandpass filter disposed downstream thereof;

a high-frequency switch circuit connected to said first filter circuit for switching a transmitting signal path and a received signal path of a third transmitting/receiving system.

20 5. A high-frequency switch circuit common to high-frequency signals of a plurality of frequency bands comprising:

first and second filter circuits connected to an antenna terminal and having different passbands from each other;

25 a first high-frequency switch connected to said second filter circuit for passing a transmitting signal of a first frequency band or a transmitting signal of a second frequency band but blocking a received signal of said first frequency band and a received signal of said second frequency band;

a second high-frequency switch connected to said second filter

circuit for passing a received signal of said first frequency band or a received signal of said second frequency band but blocking a transmitting signal of said first frequency band and a transmitting signal of said second frequency band;

- 5 a branching circuit connected to said second high-frequency switch for passing one received signal of said first or second frequency band but blocking the other received signal, comprising a first high-frequency circuit comprising a first phase shifter connected to a terminal on the side of said second high-frequency switch and a first bandpass filter disposed
10 downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said terminal and said second bandpass filter disposed downstream thereof;

- a third high-frequency switch connected to said first filter circuit for passing a transmitting signal of a third frequency band or a transmitting
15 signal of a fourth frequency band but blocking a received signal of said third frequency band and a received signal of said fourth frequency band;

- a fourth high-frequency switch connected to said first filter circuit for passing a received signal of said third frequency band or a received signal of said fourth frequency band but blocking a transmitting signal of
20 said third frequency band and a transmitting signal of said fourth frequency band; and

- a branching circuit connected to a fourth high-frequency switch for passing one received signal of said third or fourth frequency band but blocking the other received signal, comprising a first high-frequency
25 circuit comprising a first phase shifter connected to a terminal on the side of said fourth high-frequency switch and a first bandpass filter disposed downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said terminal and a second bandpass

filter disposed downstream thereof.

6. A high-frequency switch circuit common to high-frequency signals of a plurality of frequency bands comprising:

- 5 first and second filter circuits connected to an antenna terminal and having different passbands from each other,
- a first high-frequency switch connected to said second filter circuit for switching a signal path for passing a transmitting signal of a first frequency band and a transmitting signal of a second frequency band, and a signal path for passing a received signal of said first frequency band and a received signal of said second frequency band;
- 10 a branching circuit connected to said first high-frequency switch for passing one received signal of said first or second frequency band but blocking the other received signal, comprising a first high-frequency circuit comprising a first phase shifter connected to a terminal on the side of said first high-frequency switch and a first bandpass filter disposed downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said terminal and a second bandpass filter disposed downstream thereof;
- 15 a second high-frequency switch connected to said first filter circuit for switching a signal path for passing a transmitting signal of a third frequency band and a transmitting signal of a fourth frequency band, and a signal path for passing a received signal of said third frequency band and a received signal of said fourth frequency band; and
- 20 a branching circuit connected to said second high-frequency switch for passing one received signal of said third or fourth frequency band but blocking the other received signal, comprising a first high-frequency circuit comprising a first phase shifter connected to a terminal on the side of said second high-frequency switch and a first bandpass filter disposed
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downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said terminal and a second bandpass filter disposed downstream thereof.

7. The high-frequency switch circuit according to any one of claims 1-6, wherein transmission circuits of a plurality of frequency bands are common to said transmitting/receiving systems.

8. The high-frequency switch circuit according to any one of claims 1-7, wherein each of said transmission lines has a line length of $\lambda/10$ - $\lambda/4$.

9. The high-frequency switch circuit according to any one of claims 1-8, wherein said first and second bandpass filters are surface acoustic filters, laminate-type dielectric filters, coaxial resonator filters or bulk-wave filters.

10. The high-frequency switch circuit according to any one of claims 1-8, wherein an unbalanced output-type surface acoustic filter is used for a bandpass filter of said branching circuit, and a balun having an unbalance-balance conversion function is connected to the output of said unbalanced output-type surface acoustic filter.

11. (Amended) The high-frequency switch circuit according to any one of claims 1-8, wherein a diode is used for said high-frequency switch.

12 (Amended) A branching circuit module comprising a first high-frequency circuit comprising a first phase shifter connected to a first terminal for inputting and outputting high-frequency signals and a first bandpass filter disposed downstream thereof, and a second high-frequency circuit comprising a second phase shifter connected to said first terminal, and a second bandpass filter disposed downstream thereof, said first phase shifter and said second phase shifter being contained in a sintered laminate of dielectric green sheets, said first passband filter and said second passband filter being mounted onto said laminate.

13. (Amended) The branching circuit module according to claim 12, wherein said first phase shifter is constituted by a transmission line having such a line length that the impedance of said first high-frequency circuit viewed from the input side is substantially open at a passband frequency of said second bandpass filter, and said second phase shifter is constituted by a transmission line having such a line length that the impedance of said second high-frequency circuit viewed from the input side is substantially open at a passband frequency of said first bandpass filter.

14. A high-frequency switch module comprising the high-frequency switch circuits according to any one of claims 1-11 for handling a plurality of transmitting/receiving systems of different passbands, wherein each high-frequency switch circuit comprises a phase shifter, a bandpass filter and first and second filter circuits each constituted by a transmission line and a capacitor.

15. The high-frequency switch module according to claim 14, wherein at least part of transmission lines and capacitors in said phase shifter, said bandpass filter and said first and second filter circuits and at least part of transmission lines in said first to fourth high-frequency switches are constituted by electrode patterns formed on a plurality of green sheets made of a dielectric material, said green sheets being laminated and sintered to an integral laminate containing said electrode patterns, with diodes constituting said high-frequency switches mounted onto said integral laminate.

16. A wireless communications device comprising the high-frequency switch module according to claim 14 or 15.

17. A mobile phone comprising the high-frequency switch module according to claim 14 or 15.

18. A mobile phone comprising the high-frequency switch circuits

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